USK UNIVERSITAS SYIAH KUALA

FACULTY OF AGRICULTURE

DEPARTMENT OF SOIL SCIENCE

UNDERGRADUATE PROGRAM **MODULE HANDBOOK**

Module designation	Plant Nutrition (SSOL3046)
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Prof. Dr. Ir. Sufardi, M.S.
Language	Indonesian, English
Relation to curriculum	Compulsory module for Soil Science Department
Teaching methods	Lecture, presentation, focus group discussion
Workload (incl. contact hours, self-study hours)	✔ Lecture and discussion 100 minutes per week per semester ✔ Structured tasks 120 minutes per week per semester ✔ Personal tasks 120 minutes per week per semester
Credit points	2 SKS = 3.2 ECTS
Required and recommended prerequisites for joining the module	SSOL2026
Module objectives/intended learning outcomes	✔ Students are able to understand the fundamental concepts of plant nutrients, including essential and non-essential elements, trace elements and contaminants, classification of nutrients (macro and micronutrients), their functions in plant physiology, as well as the mechanisms of nutrient uptake and transport in plants. ✔ Students are able to Identify and understand various types of fertilizers and the process of organic fertilizer production, their application in cultivated crops, and demonstrate skills in developing innovative fertilization technologies to support sustainable agricultural practices. ✔ Students are able to diagnose nutrient status in soils and plants through field observation, laboratory analysis, and fertilization experiments, and accurately calculate nutrient requirements and provide fertilizer recommendations.
Content	This module provides knowledge about the basic concepts of plant nutrition, the function of nutrients, processes, and mechanisms of plant nutrient absorption, nutrient partitioning, soil nutrient names, nutrient mobility in plants, nutrient diagnosis techniques in the field (visual), and the laboratory (plant analysis) as well as determining critical levels of nutrients and estimation of plant nutrient requirements.
Exams and assessment formats	Quiz, assignment, midterm exam, final exam

Study and examination requirements	✔ Quiz: 27% ✔ Assignment: 28.5% ✔ Midterm exam: 20% ✔ Final exam: 24.5%
Reading list	1. Sufardi, 2019. Pengantar Nutrisi Tanaman. Syiah Kuala University Press, Banda Aceh 2. Kumar, V., Srivastava, A.K. and Suprasanna, P., 2021. Plant Nutrition and Food Security in the Era of Climate Change. 3. Marschner, P. and Rengel, Z., 2023. Nutrient availability in soils. In: Marschner's Mineral Nutrition of Plants. Elsevier. pp.499–522. 4. de Mello Prado, R., 2021. Mineral nutrition of tropical plants. Springer. 5. Rengel, Z., Cakmak, I. and White, P.J., 2022. Marschner's mineral nutrition of plants. Academic Press.